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A BRIEF CONSIDERATION OF A FEW FACTS DETERMINING THE RELATIONSHIP BETWEEN THE SCIENCE AND ART OF PHARMACY AND THE SCIENCE AND ART OF MEDICINE.

By Henry Beates, Jr., M.D.

℞ Aconitiæ Cryst. Merck . . . . . Gr. 1–20.
Resinæ Phosphori, 4 per cent . . . . . Gr. v.
Calcii Phosphatis . . . . . Gr. xlviii.
Misce et fiant capsulas numeros quatuor et viginti.
Signa.—One every two hours for four or five doses, then one every four hours, constitutes an "instrument" which is exponent of many *facts* associated with life and the profoundest interests of human existence.

The prescription is designated "an instrument" because of its legal significance, for it is a "writing acknowledging or certifying to a claim, or recording the terms of a contract, deed or grant," and by common consent presupposes a right, by reason of the possession of qualification, to formulate and to have compounded and administered, without harm, according to obtaining conditions.

It is evidence, and should be proof, of the possession of a reasonable degree of mastery of those sciences and their art, common in large measure to the professions of pharmacy and medicine, and is the common ground upon which we meet, under conditions of a *naturally* founded relationship.

Our respective professions are effects of antecedent causes, and in a wider signification the evolution of humanity. They are facts of being, and in importance occupy the highest place.

For the discharge of the responsible functions attaching the professions of pharmacy and medicine, a degree of scholarly skill and attainment is requisite, which is, unfortunately, too commonly found

to be wanting, and, happily, in this period of human progress, beginning to engage the serious attention and partial supervision of Government.

Control, therefore, of the conferred right to formulate a prescription, to compound the same, and to superintend its use, discovers two professions, related by many similar conditions, which for their observance and requirements demand co-operation, if their normal growth and development and consequent usefulness is to be vouchsafed, and mankind to profit from their inherent utilitarianism.

A fellow-being is stricken with some illness, or is the victim of an accident or deformity that impairs his usefulness, which, in addition to inflicting discomfort and suffering, seriously interferes with the exercise of those functions which secure the necessities not only of his own but dependent lives.

The sciences and art of pharmacy and medicine are his principal means of relief—his almost only hope for restoration. Can anything be of greater value under such sore affliction? Can anything demand so important a degree of qualification to cope with the involved complex and profound problems as the professions we represent?

A word as to the science feature of our professions:

Medicines are derived from the vegetable and mineral world, and the specific use of the forces is also to be included in the term. This fact renders it necessary that a knowledge of those principles which affect the functions of the human economy, be possessed by some characteristic group of mankind.

Of the vegetal origin of remedial agents, for illustration, it must be known at what period of the growth of an herb, tree or what not, its medicinal active principles are most advantageously obtained; also what these are, and whether to be extracted from the root, rhizome, bulb, stem, bark, leaves or fruit, and how.

Separation of the various active principles, so commonly existing in a given vegetal organism, is essential, especially as one or more possess properties which, when administered to the human being, frequently exert diverse and even antagonistic influences.

Again, the season or time of year at which the various plants, etc., possess these principles, in their fulness, must be known—a science of no mean value, and essential for the best achievements of pharmacy and medicine.

How to extract these principles demands a mastery of the science of chemistry, so self-evident that it is needless to more than give it mention. The magnitude thereof speaks for itself; its requirements are self-evident; but that the mastery of chemistry, as applied to pharmacy, in contradistinction to the mastery of chemistry as applied to medicine, constitutes practically an especial study and pursuit, cannot be too strongly emphasized, and the one cannot be substituted for the other.

That these two phases of chemistry do, however, possess some features in common, as is illustrated in incompatibility in unscientifically formulated prescriptions, goes without saying. Yet this constitutes an entirely different question, and should not prevail, except for lack of proper qualification.

To be brief, a knowledge of the inherent properties possessed by remedial agents includes their physical, chemical and physiologic potentials. The two former belong to the pharmacist, and the latter, in an especial sense, to the physician.

This fact cannot be too clearly appreciated and comprehended, and may be emphasized by stating that the science of pharmacy requires a mastery of botany, including the anatomy and physiology of plant life, as well as of chemistry in a specific sense.

The technical phases include the ability to recognize both the macroscopic and microscopic characteristics of the medicinal plant world, the proper methods of obtaining active principles, and preparing the various tinctures, infusions, extracts, alkaloids, glucosides, etc., and to be able to know that these products are of an approximately standard strength and value. In a more special sense, a pharmacist must be skilled in the art of properly compounding a *correctly formulated prescription*, which latter, it is stated with regret, is not as uniformly written as the qualification rightfully expected from the medical profession should supply.

The preparation, and, what is equally important, the means of preserving, unaltered, the inherent potentialities of remedies, also belongs to the domain of pharmacy. The same general principles or facts are applicable to the remedial agents obtained from the mineral world.

Science and art, therefore, in their highest significance, characterize pharmacy, and demand of its followers a high standard of scholarly attainment and an equally exalted degree of skill.

The science and art of medicine demands a mastery of the sciences of biology, anatomy, physiology, chemistry and pathology. The natural course of disease, injury, and the consequences of deformity, comprise a phase of medicine not here necessary to be elaborated, but, QUALIFICATION, in the broad sense, to as successfully as possible restore to a common equilibrium, these manifold afflictions, is pre-eminently the high function and weighty responsibility of medicine.

In a word, pharmacognosy constitutes the truly science side of the profession of pharmacy. Its profundity and scope, and the possession of its practical *qualifications, its art,* can only belong to those learned followers who devote their entire talents to its demands. It is impossible for a physician to possess himself of the specific ability belonging to the science and art of pharmacy, just as it is alike impossible for a pharmacist to acquire the specific ability of the physician. Thus is distinctly seen the *individuality*, so to speak, of the respective professions, also their mutual interdependence.

To repeat, in the prescription are embodied the points of contact and parallel action establishing that common relationship which constitutes a bond of union between the sciences of pharmacy and medicine and their art, without which neither can achieve the common good for mankind which should be a certainty.

The prescription *is evidence and proof of professional qualification.* Its formulation attests the ability of the physician; its compounding that of the pharmacist. 'Tis the crystalline product of the two professions, and is proof of the existence of that relationship which is the inevitable resultant of these two great callings of life.

What, therefore, if these expressed generalizations be true, can be achieved, if there is not throughly established, upon a practical basis, that inherently essential relationship between pharmacy and medicine, which *natural law determines?*

There must be *qualification* on the part of each. *This implies a higher standard of education than has hitherto obtained!* Pharmacy and medicine demand a higher degree of scholarship, for without it the possibilities of each cannot be hoped for.

This fact is perhaps best demonstrated by the prescription as it is usually discovered. That the prescription is distressingly empirical does not need demonstration. This criticism does not include what, for self-evident reasons at the present, is to be regarded as normally so, but what is, from the point of view of *qualification*, inexcusably prevalent.

Too frequently are physical, chemical and physiological incompatibilities contained in even one prescription, and this means the defeat of the very purposes intended. It emasculates medicine of its intrinsic value, and supplies to suffering humanity a false trust; it robs pharmacy of its science and art!

The sum total of results of such deplorable incompetence are the growth and development of a like valueless group of "pathies," the prescribing of all sorts of *worse than useless compounds and mixtures* —the annihilation of the art of therapeutics, seriously endangering both, and the belittlement of pharmacy and the growth and thriving of a debased commercialism, which bids fair to prolong the inadequateness of pharmacy and medicine to benefit mankind, as their created and inherent powers enable them to do, where qualification is a *sine quâ non* for its followers.

To correct this malignant defect demands intelligent co-operation on the part of each by each. The students entering the respective callings, from the present on, must be individuals of a broader training and higher education; their study and teaching and training must be of a standard yet to be established! *A rational curriculum* for each is to be founded and administered to the full, with an eye single to the magnitude of the interests involved, for the enormity of the attaching responsibilities, and for the greatest good of fellowman.

When such will have been achieved, the proper relation between the sciences and art of pharmacy and medicine will be established, and mankind profit, and be made secure against his greatest enemy —disease, deformity and injury.

Sociologic evolution finds pharmacy and medicine regulated by Boards of Examiners. Their establishment here encountered bitter opposition, and their operation much adverse criticism, and while glaring defects characterize these, efforts to perfect and not to belittle should prevail.

The existence of statutory control of the practice of pharmacy and medicine is proof of a commercial degeneracy from the highest standard of proficiency to low and dangerous practices by ignorant and incompetent practitioners of both.

The welfare of the people demands protection against the evil consequences of incompetent pharmacy and medicine, and a too firmly entrenched and unprincipled commercialism still commands

too much sympathy and advocacy on the part of the public, when efforts at correction are aggressively active.

There is, however, one grand principle ever potent in encouraging and supporting the inevitable progress crowning the efforts for standardization—it is law, and that the respective professions may be better acquainted with their rights and privileges to apply this power to their duties of higher citizenship, the following quotation will be presented :

(*From U. S. Supreme Court Reports for 1888, Opinion of Chief Justice Field,*) (*affirmed by the unanimous opinion of the Court!*)

"It is undoubtedly the right of every citizen of the United States to follow any lawful calling, business or profession he may choose, subject only to such restrictions as are imposed upon all persons of like age, sex and condition.

"This right may in many respects be considered a distinguishing feature of our republican institutions. Here all vocations are open to every one on like conditions. All may be pursued as sources of livelihood, some requiring *years of study and great learning* for their *successful* prosecution.

"The interest, or as it is sometimes termed, the estate acquired in them, that is, the right to continue their prosecution, is often of great value to the possessors, and cannot be arbitrarily taken away from them any more than their real or personal property can thus be taken.

"But there is no arbitrary deprivation of such right where its exercise is not permitted because of a failure to comply with conditions imposed by the State for the protection of society.

"The power of the State to provide for the general welfare of its people authorizes it to prescribe all such regulations as, in its judgment, will secure or tend to secure them *against the consequences of ignorance and incapacity, as well as of deception and fraud.*

"As one means to this end, it has been the practice of different States from time immemorial to exact in many pursuits a certain degree of skill or learning upon which the community may confidently rely, their possession being generally ascertained upon an examination of the parties by competent persons, or inferred from a certificate to them in the form of a diploma or license from an institution established for instruction on the subjects, scientific and otherwise, with which such pursuits have to deal.

"The nature and extent of the qualifications required must depend primarily upon the judgment of the State as to their necessity. If they are appropriate to the calling or profession, and attainable by reasonable study or application, no objection to their validity can be raised because of their stringency or difficulty. It is only when they have no relation to such calling or profession, or are unattainable by such reasonable study or application, that they can operate to deprive one of his right to pursue a lawful vocation.

"Few professions require more careful preparation by one who seeks to enter it than that of medicine. It has to deal with all those subtle influences upon which health and life depend, and requires not only a knowledge of the properties o vegetable and mineral substances, but of the human body in all its complicated parts, and their relations to each other, as well as their influence upon the mind.

"The physician must be able to detect readily the presence of disease, and prescribe appropriate remedies for its removal. Every one may have occasion to consult him, but comparatively few can judge of his qualifications of learning and skill.

"Reliance must be placed upon the assurance given by his license, issued by an authority competent to judge in that respect, that he possesses the requisite qualification. Due consideration, therefore, for the protection of society may well induce the State to exclude from practice those who have not such a license, or are found upon examination to not be fully qualified."

The same principle is as forceful and just in its application to pharmacy as it is to medicine.

Another feature, and your time will not be further occupied. As man's interests are so closely related to our respective professions, we find ourselves responsible for what Marshall O. Leighton, in the *Popular Science Monthly* for June, 1902, treats under the title, "The Commercial Value of Human Life."

Four of his conclusions are presented:

(1) The pecuniary value of life is subject to the same economic laws as are applied to the more vulgar commodities.

(2) In the courts of law the measure of an individual's productiveness, which is the measure of his value, receives the most careful scrutiny; therefore, the decisions of such courts, where existing statutes permit, are trustworthy in determining an individual's value to his family.

(3) The pecuniary value of a life to its relatives represents its pecuniary value to society.

(4) Damages given for wrongful death are such that they can be represented by an average in different groups of age, with only narrow limits of probable error.

These features of man's general relationship are indissolubly associated with the proficiency of the professions we represent, and it is our province to see to it that Ph.G. and M.D. constitute a *reality* when man's greatest interests, because of affliction, are intrusted to our *qualification* to serve him conscientiously and well, and thus to be beyond the possibility of a liability due to incompetency or neglect.

'Tis only the unprincipled and commercially degenerate, *misrepresenting our two grand and noble professions*, who, in addition to prescribing quack nostrums, and all sorts of mixtures, compounds, etc., offer objection and opposition to higher standardization. All such, whether individual or institutional, should be well known and accorded the full measure of their merits.

AN IRREMOVABLE STIGMA.

Our duty is plain—let us each, fearlessly and actively, co-operate in establishing those conditions which, other things being equal, will achieve the desirable end, and find the follower of pharmacy and medicine meriting that confidence and respect on the part of fellow-men, which his conscientious discharge of duties, character and honor command!

A TENDENCY IN MEDICINE AND ITS INFLUENCE ON PHARMACY.

By John H. Musser.

In speaking of the relation of the science and art of medicine to the science and art of pharmacy, one must reflect upon the status of medicine in coming years. From the indications of to-day, just as the present compares with twenty years ago, one can see less and less of the use of drugs and more and more of measures. Twenty years hence, one can conceive of almost a minimum of drugs. Just recently a paper by Northrup, of New York, forcibly put the value

of fresh air and the proper use of water in the treatment of broncho-pneumonia.

In a very severe case of this grave disease in a child, fresh air, proper feeding and bathing and good nursing constituted the whole scheme of treatment. So in many infectious diseases, and their number will increase, the antitoxins and other scientifically precise measures will be employed. Is not the dictum for the treatment of tuberculosis, rest, fresh air, food, a war cry against drugs? So in local diseases, as those of the abdomen, we do not treat the belly pain, but we find the cause, and in a large percentage of cases the surgeon does the rest. In stomach disorders, in pulmonary, brain and other diseases, surgery plays a large part. In short, we have learned not to be afraid of air, not to be afraid of water, not to be afraid of food wisely directed.

Then see what is coming out of physics, in light-treatment, the X-rays and wonders yet to be disclosed. From organic extracts we are getting a most brilliant therapeutic future.

Moreover, the multiplicity of hospitals, the advent of water cures, etc., will change the status of pharmacy.

We must recall the exact meaning of profession, and whether it is possible that the science of pharmacy can be a profession, or even if desirable to place it in such class. A member of a profession is one who has something to give to those whether rich or poor which cannot be estmated in pounds and ounces or pints and quarts. Moreover, self is not presumed to be considered in the dispensation of his gifts, and to whomsoever that cometh the utmost shall be given. Is it practical that the science of pharmacy should build on such lines?

Indeed, as the medical profession, and it is true of law in part, and I take it of the ministerial profession, in these modern days, in the process of our evolution, the old view does not so well obtain, and I hold it is better for medicine that it does not. The various quicksands and pitfalls that attend the prosecution of our art are better guarded against by the close prosecution of our duties as a science.

I have urged that the pursuit of medicine is conducted from this standpoint and for these brief reasons. Science is truth, and the pursuit of science is the pursuit of truth. Association with truth, an acceptance alone of truth, the search for truth begets character. It is character that stands for men, and, therefore, whatsoever pur-

suit has in it men of character, little need be said among themselves of ethics. There is no surer way of men learning the force of the Golden Rule than in the drill which obtains in the pursuit of science. The man of science learns and acts on Emerson's creed—"whatsoever a man does to his neighbor, whether for good or evil, he does unto himself."

I plead, therefore, that you make the calling of pharmacy not a profession, but a science, and that you insist its conduct must be on the highest scientific planes to the end that those who are its devotees may be counted upon, in season and out of season, as men having no code and no regulations, breathing only the spirit of "doing unto others as you would be done by."

THE PHARMACIST AND THE PHYSICIAN: A NEW ASPECT OF THE CASE.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

Some of the articles that have recently appeared in medical, as well as in pharmaceutical, journals would appear to indicate that the relations existing between pharmacists and physicians are in an unsatisfactory and altogether unsettled condition. While it is true that the subject-matter under discussion is not new, and that many of the questions that are now involved have arisen over and over again for upwards of a century, some recent developments in connection with the trade in nostrums, or patent medicines, have added a tone of bitterness to the controversy that will not tend to bring about more amicable relations in the near future.

Unfortunately, too, there is, in nearly all of the printed articles, an evident tendency to hold up the shortcomings and frailties of a few as an evidence of the tendency and ideals of all. That there are members in both professions who do not live up to the prescribed principles or codes of ethics, and whose technical training or skill does not compare favorably with the best that is attainable, all must admit. But to say, on the other hand, that all of the members of these respective callings are guility of any or all of the accusations that have recently been made would be overstepping the bounds of truth very materially. Over and above the evident falsity of any series of general accusations, we should always remember that

crimination or recrimination will not, and cannot, of itself bring other than discredit to all concerned.

It will be much more in keeping with a genuine desire for progress, therefore, if we as pharmacists, recognizing the shortcomings of physicians, also recognize our own, and honestly strive to correct existing abuses by the gradual elimination of objectionable practices.

In the following pages I have tried to outline what I consider the underlying causes of many of the present differences of opinion, and also to indicate the position that I believe pharmacy will hold in the future. In addition to this I have attempted to indicate how we as individuals can, now and in the near future, contribute very materially to bring about a better understanding between pharmacists and physicians, and incidentally contribute no little to a better knowledge of drugs and medicines on the part of future graduates in medicine.

The retail pharmacist of to-day occupies rather an anomalous position, being, or attempting to be, a conglomerate of small tradesman, artisan and member of a liberal profession. In this varied calling he has acquired interests which are at least partially, if not wholly, antagonistic to each other, and which have certainly tended to keep him within distinctly narrow bounds. As a professional man he has not developed as rapidly as was confidently asserted he would half a century or more ago. Among the reasons for this lack of development may be mentioned, that as a whole he has become too numerous, and that the system of education which has been provided for him has proven itself inadequate to develop the principles necessary for the evolution and growth of a professional spirit.

It should be mentioned, however, that despite the meagre training of the earlier apothecaries, or "pharmaceutists" as they were sometimes called, American pharmacy has contributed no little to the sum total of our knowledge of drugs and medicines. Such men as Procter, Parrish and Bedford, although restricted almost entirely to the limited educational facilities of the pharmaceutical schools of their day, have accomplished work that we and future generations of pharmacists may point to with pride.

It has been frequently predicted, and for apparent good reasons, that in the future economic arrangement there will be no need and no place for the retail druggist of to-day or of yesterday. Be that

as it may, so far as the purely commercial interests of the retail druggists are concerned, there can be no question regarding the necessity and consequent continuance of the professional pharmacist. With the constant increase of specialization in the practice of medicine, and the accompanying realization that the human body is not a machine and that its ills cannot well be treated on general principles, there must be an accompanying increase in appreciation of the competent pharmacist, who is willing and able to act as an assistant or adjunct to the medical practitioner. While it is true that the future pharmacist will not be as numerous as he is at the present time, he will occupy a relatively higher position in the social scale, and will in addition be in a position to accomplish much that will make him honored and respected at home and abroad.

For us as pharmacists it would appear imperative, then, that we bear this possible development along professional lines in mind, and see that the proper material is available when the expected change is brought about. The proper foundation for this rational development of professional pharmacy can be laid at the present time, and, in addition to this, we may aid in the pharmaceutical education of future physicians if we can, by any means at our command, improve the present status of hospital pharmacy in the United States. In the education of future generations of physicians, hospital training will necessarily play a most important part. Even at the present time a medical education that does not include at least some hospital experience is considered inadequate. This being true, it becomes evident at once that the impressions a recent graduate receives during his hospital experience—impressions of drugs and druggists—must be lasting ones, and ones that will largely control his future ideas and practices.

How wofully deficient and unsatisfactory the drug service in many of our hospitals must be, becomes evident when we realize that in this great country, with hundreds of institutions to supply them, we have had but one solitary instance of a hospital pharmacist who has become widely known through his professional and scientific work. I refer to the late Charles Rice, of Bellevue Hospital, New York, who, I am sorry to add, was himself a foreigner by birth and early training. Compared to what has been accomplished by the pharmacists of European hospitals, particularly by those of France, this is indeed a poor showing. Much of this deficiency of the past, how-

ever, could be corrected in the future if members of this Association, who are influential in their communities, will direct the attention of hospital authorities to their shortcomings in this respect.

One of the most widespread abuses in hospital and dispensary practice is due to the fact that, apart from a rather limited number of routine stock mixtures, the medicines dispensed consist largely of proprietary preparations that have been donated by charitable manufacturers with a view to having them brought to the attention of the medical men connected with the institution, and, if possible, securing from them suitable endorsements for publication. It need not surprise us, therefore, that physicians who have had hospital experience are frequently more hopelessly dependent on the use of proprietary remedies than graduates who have not had the so-called advantages of a hospital training. Much of this could and would be changed, if hospitals, particularly the larger and more influential institutions, were to employ competent pharmacists who could secure and hold the confidence of the visiting as well as of the resident staff of physicians, and who could and would be consulted on the probable standing of new remedies.

This brings us to a consideration of the intellectual needs and wants of men capable of holding such positions. If the hospital pharmacist of to-day, or the professional pharmacist of to-morrow, is to have and to hold the confidence of medical practitioners, he must be at least the equal of the medical man in education, in ideas and in ideals—so much so that with the increase in the requirements made of medical students there must be a corresponding increase in the demands that are made on the general information possessed by the future pharmacist. He must be a well-educated, thoroughly scientific and altogether capable man, well versed in all the branches of knowledge connected with his own profession, and gifted with a breadth of view that will readily place him above the average of his fellow-men. In return for his knowledge and acquirements he must not expect to be eminently successful from a monetary point of view, but he will be assured of a comfortable existence and the opportunity of doing considerable original work that may in turn revert to the material advantage of himself and his fellow-workers in the same field.

Those of us, however, who have not had the educational advantages that must be provided for the men of the future, and who

probably feel that we cannot aspire to fit in exactly with the demands that will be made of the coming professional pharmacist, can, in the meantime, conduct ourselves and our business in such a way that we will gain the trust and confidence of physicians of to-day, and in this way establish a precedent that will be of incalculable value to our more professional and scientifically more able successors of to-morrow. (*Proc. A. Ph. A.*, 1904.)

ON THE EVIDENT NEED OF A PROFESSION OF PHARMACY.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

The notes embodied in this paper are composed almost entirely of references to papers published in medical journals, or of extracts from personal letters received from medical men, who are more or less interested in the subject matter under discussion. Altogether, the paper may be considered a sequel to, or, perhaps better, a continuation of, the paper entitled, "The Pharmacist and the Physician," presented by me at the Kansas City meeting of the American Pharmaceutical Association (see page 60).

The views expressed in that paper have led to an extensive and somewhat varied exchange of opinion on the need of having or developing a profession of pharmacy, the members of which would serve not alone as purveyors of medicines and medicinal preparations, but would also assume, in a way, the position of mentors or advisors on the origin, value and probable uses of the several medicinal preparations offered to the medical profession.

Among pharmacists themselves there appears to be a considerable difference of opinion as to the need or desirability of conducting themselves, or their business, along professional lines. Many appear to hold, with a recent writer in the *American Druggist*,[1] that pharmacy is neither a profession nor the semblance of a profession.

On the other hand we have those who appear to believe that pharmacy has, even now, achieved a desirable degree of perfection, from a professional point of view, and that, therefore, they and other members of their calling should undoubtedly be considered professional men. Again there are others who assert that the pres-

ent state of the art, science or business of pharmacy does not come up to their ideal of a profession, but who also believe that there is a need of such a profession, which, if not supplied by the pharmacists now existing, will ultimately be developed as a distinct specialty of the science of medicine, under the direct supervision of medical practitioners themselves.

Among physicians, particularly such as appreciate the necessity of an ethical development of their own profession, there is absolutely no difference of opinion as to the desirability and the need of a profession of pharmacy, providing the members of that profession be imbued with high ideals and would be willing to subject themselves to restrictions similar to those that restrain and guide the present-day medical men of the better class.

That the present conditions in the business or art of pharmacy are not, in any way, compatible with professional ideas is evident from even a cursory perusal of the reading pages of medical journals. Any pharmacist who will read the editorial on "The Degradation of the Drug Store" in *American Medicine*,[2] or the more recently published article on "Ethical Pharmacy," by Dr. A. L. Benedict, in the same journal,[3] must admit that the conditions as depicted in these articles actually do exist, and that they can in no way be brought in harmony with the necessary ideals of a profession.

The assertion made by one writer that even good druggists make careless and unnecessary mistakes, and the nature of these mistakes, as enumerated by the same writer,[4] are in every way to be deplored. Accidents of this kind are, perhaps, to be condoned, however, on the plea that the prescriptions were not sufficiently legible or explicit. This same excuse cannot be brought to bear on the frequently made and ofttimes repeated accusation of deliberate and malicious substitution.

This accusation has been and is being made so frequently that it has attracted the attention of all classes of medical as well as lay journals. The *New York Times*, in an editorial recently quoted by *American Medicine*,[5] suggests that radical measures are needed to redeem the drug business from the low estate into which it has fallen, and adds that unless druggists themselves awaken to the necessity of exposing unprincipled and dishonest members of their calling, they will be attacked from the outside in sledgehammer fashion.

There is one, recently published, article on this particular subject that should receive more than passing notice. This is the paper on "The Relation of the Physician to Proprietary Remedies—How may substitution be avoided and the desired remedy obtained without unduly advertising the manufacturer?" by Dr. William J. Robinson, of New York, read at the meeting of The American Medical Association, at Atlantic City.[6]

In this paper Dr. Robinson unequivocally asserts that substitution is extensively practised, and, as a possible remedy, unhesitatingly recommends that physicians choose what he considers the lesser evil, by prescribing for original packages of galenical preparations; despite the fact that they are running the risk of having these preparations used indefinitely, as household remedies, by the patient and his friends.

While pharmacists will, no doubt, feel that there is much in this paper by Dr. Robinson from which they might reasonably differ, there is also much, more than appears on the surface, that must necessarily reflect discredit on the present-day practice of pharmacy. Is it, for instance, not true that the dozens, scores and even hundreds of questionable proprietary preparations on the market at the present time are made and sold by so-called reputable pharmacists, or people who pose as pharmacists? And even further, is it not true that the composition of many of these preparations is kept secret, and that, in connection with many of these secret, or semi-secret, preparations claims and statements are made that are misleading, if not positively untrue? And still further, it may be asked, how much of this direct or implied deception have pharmacists honestly striven to correct, knowing all the while, as they should know, that the preservation of the health, happiness, and even the lives of human beings, was at stake.

If we consider carefully the several lines of thought suggested here, we will probably come to the conclusion that, after all, pharmacists are, as a whole, less sinned against than sinning, in this matter of proprietary preparations. The question itself is a vital one, however, and must be disposed of at an early date in a satisfactory manner, for, as a writer in a medical journal asserts,[7] "Secrecy in medicinal preparations is dangerous to patients, destructive of science and promotive of fraud and avarice." For the correction of this really heinous abuse there is but one rational remedy: the development of a truly ethical profession of pharmacy.

That physicians, and by physicians I mean medical men having ethical ideals, are willing and even anxious to assist pharmacists to improve themselves and their calling, is amply evidenced by the numerous kindly words of advice and encouragement to be found in the same medical journals that appear to be the most bitter in their denunciation of supposed abuses. One writer in *American Medicine* says: "The physician is dependent for his results in drug therapy upon the honor and skill of the pharmacist. It is therefore in the interest of science and of mankind that a sharp line be drawn between the honorable and the dishonorable, the careful and the indifferent, the skilled and the blundering among pharmacists. It is likewise important that the pharmacist be more than a salesman of manufactured articles. No one needs a liberal preliminary education and four years of laboratory training to hand out ready-made preparations." [7]

Dr. A. L. Benedict, in his paper on "Ethical Pharmacy," quoted above,[3] gives several practical suggestions as to how the existing evils might be remedied, and in a personal letter on the same subject says: "With regard to the question, Is a profession of pharmacy necessary or desirable? it seems to me there is no possible successful argument on the negative side. Indeed, I am by no means entirely opposed to the present make-up of the drug-store with its extra professional branches, but do not believe that the pharmacist should pose as a physician. My objections to such practices (nostrum vending and counter prescribing) are, (1) that it undermines health, and kills human beings; (2) that it is ultimately contrary to statute law; (3) that these are facts because the pharmacist is not competent to practise pharmacy. I believe that any pharmacist who would drop his stock of patent medicines and put up a sign that he was not a physician and would not handle products which were to be taken indiscriminately, and who would demonstrate by consistent, honorable methods, that he meant what he said, would, after a year or two, receive the cordial support of the medical profession and of the intelligent laity."

Commenting on the probable status of "The Pharmacist of the Future," the *New York Medical Journal*, in an editorial,[8] says: "The physician frequently finds himself disposed, almost constrained, to seek for information from the pharmacist," and further expresses the opinion that the necessary training that must be accorded the

pharmacist of the future will enable him to render conspicuous service, which will go far to lessen the time spent in clinically testing comparatively worthless medicinal preparations.

The need of reliable advisors on matters pharmaceutic, particularly in connection with the so-called newer remedies, is further emphasized by a paper on "The Trend of Modern Prescription Writing," by Dr. M. Clayton Thrush, recently read before the Philadelphia County Medical Society.[9] In this paper the writer points out some of the more evident shortcomings in the present-day methods of teaching pharmacy in medical schools, and concludes that "the trend of modern prescription writing is in favor of proprietary preparations" largely because the young practitioner does not possess the requisite knowledge to combine drugs or preparations without forming unsightly or dangerous compounds.

This paper also emphasizes the inefficiency, from a practical point of view, of attempting to teach the practice of medicine by theory alone, and offers the best possible arguments on the necessity and importance of hospital experience to young practitioners. Such a post-graduate course of hospital training was strongly advised by Dr. John H. Musser in his address as President of the American Medical Association.[10] The practical utility from a pharmacologic point of view is made somewhat doubtful, however, by the assertion of Dr. O. T. Osborne, who says:[11] "When our graduate goes to a hospital he begins to use the hospital formulæ, and forgets entirely how to write prescriptions." This assertion, made by a teacher of considerable experience, is unfortunately too true, and is, in a measure at least, largely due to the subordinate position occupied by the hospital pharmacist.

How far or how much individual hospital pharmacists are to be blamed for the lack of confidence they are able to inspire, I am not in a position to say. Certain it is that as a class, who should have every facility for original observation and study, they have contributed little, very little, to the sum total of pharmaceutic knowledge.

That there is a wide and interesting field of work for the hospital pharmacist; that he is, in fact, the logical beginning of a profession of pharmacy, and that some of our ablest and busiest medical men have devoted considerable thought to the problem, is evidenced by the following extracts from letters recently received, from Dr. Wil-

liam Osler, of Johns Hopkins Hospital, Baltimore, who says: "What you say about the hospital pharmacist is very true. I have long felt that we have not done our duty here, as, perhaps, we might, in stimulating this important branch of our work.

"I feel that the department of pharmacy in our large hospitals should be made co-ordinate with the other important divisions that the teaching of medical students practical pharmacy should be part of the work, and that all possible opportunity should be given the men in charge to keep themselves abreast with the most advanced work in their specialty.

"Would it not be a good thing for the hospital apothecaries to organize a special society in which their work could be codified and brought before the profession?

"It might be well to get a list of the pharmacists at the different large hospitals throughout the country, and then send them a circular urging the formation of such a society or club."

Without going into a detailed discussion as to my own ideas on the feasibility of these suggestions I would say that other medical men have heartily endorsed the sentiments here voiced by Dr. Osler, and practically agree that able and properly trained hospital pharmacists should, and would, be important and valuable factors in the development of the science of medicine. Further than this, a really able body of hospital pharmacists should and would have a beneficent influence on the evolution and development of a profession of pharmacy the members of which would be imbued with high ideals and would in turn be duly appreciated for their worth and attainments. In summing up, then, I would say that the suggestions as here outlined would necessarily include:

(1) A somewhat radical change in our present standards of pharmaceutical education.

(2) The introduction of hospital pharmacists with professional ideals and scientific attainments.

(3) The ultimate complete separation of the trade in drugs, nostrums, soft drinks and tobacco from pharmacy and the ultimate establishment of pharmacy on a high professional plane.

In conclusion, I would say that while these ideals may appear to you impracticable, I believe their achievement is not impossible, and, further than this, is absolutely necessary to rescue the practice of pharmacy, and with it every department of medicine, from the

slough of commercialism in which they are slowly but surely sinking.

TITLES OF PAPERS REFERRED TO.

[1] "Is Pharmacy a Profession?" *American Druggist*, Dec. 19, 1904, p. 419.

[2] "The Degradation of the Drug Store." *American Medicine*, July 2, 1904, p. 1.

[3] "Ethical Pharmacy." *American Medicine*, Nov. 26, 1904, p. 935.

[4] "Careless Mistakes of Good Druggists." *American Medicine*, July 9, 1904, p. 87.

[5] "Our Pharmacy Laws." *American Medicine*, Dec. 31, 1904, p. 1122.

[6] "The Relation of the Physician to Proprietary Medicines." *The Journal of the American Medical Association*, Dec. 3, 1904, p. 1675.

[7] "Proprietary or Secret." *American Medicine*, No. 12, 1904, p. 863.

[8] "The Pharmacist of the Future." *New York Medical Journal*, Nov. 12, 1904, p. 937.

[9] "The Trend of Modern Prescription Writing." *Journal of the American Medical Association*, Jan. 7, 1905, p. 35.

[10] "President's Address." *Journal of the American Medical Association*, June 11, 1904, p. 1533.

[11] "Discussion." *Journal of the American Medical Association*, Dec. 3, 1904.

THE ETHICAL RELATION OF PHARMACISTS AND PHYSICIANS.

There was an interesting discussion following the reading of three of the preceding papers which were presented at the Pharmaceutical meeting on Tuesday evening, January 10th. Some of the remarks are published at this time.

DR. HENRY BEATES, JR.,

said: I regret that Dr. Musser has gone, because while with much that he said I agree, there is also much with which it is impossible to entertain a like opinion. If his remarks were correctly understood, the inference was given that, in the near future, there would be little or no use for drugs or medicines, and, consequently, little or no use for pharmacy.

That such an ultimate condition could be possible cannot for one moment be even conjectured. It is difficult to understand how such a question could so much as arise. Let us see why. Dr. Musser referred to the fact that physicians are learning the proper use of fresh air, sunlight and food in the treatment of disease. May they not also begin to learn how to properly employ medicines in the treatment of human ills?

As far as these go it is a distinct advance in treatment; but, at best, only a departure, *not an advance*, from a dangerous and ignorant administration and use of powerful remedies that are frequently, because of an incompetent profession, combined in all sorts of ways, certain to work injury rather than benefit, and administered with little or no understanding. As the profession is, there are those who are unable to recognize whether or not their prescriptions are being taken!

'Tis a serious and difficult work for a human system to recover when stricken with disease, even when *unassisted* by the skilled administration of drugs known to exert favorable influences, but when such an afflicted being is obliged to contend against both disease and unskilfully administered and, because of incompetence, injuriously given drugs, a return to health is almost impossible; and most direful consequences are certain to frequently result and unquestionably do!

Therefore, the commendable and comparatively only safe resort to *only* fresh air, sunlight and proper food, while an advance in treatment in one respect, *and safe*, is at the most *and* best but a departure from a dangerous practice, based upon and resulting from ignorance and incompetency.

In addition to these there frequently, *not always*, must be skilled and competent medication. There are certain facts of existence, affirm, deny, and theorize about them as you will, which, nevertheless, *exist* in their inherent and originally *created potentiality*, no matter what may be done for or against them. They are and dare not be denied.

With these *facts*, it is reverently said, that an Omnipotent and Omniscient Being has created, are associated unalterable and never-varying laws! With these laws the qualified *practitioners of our profession* MUST *comply!*

The cells composing the various tissues and organs of our bodies are affected in their life actions and functions by those influences which are the consequences of these immutable laws, and in the vast vegetal and mineral world, thus created, are principles (MEDICINES AND DRUGS) which, like the principles of disease-causing factors, so affect the cells of the human body, that, if rightly used by an *educated, competent*, and *skilled profession*, WILL restore diseased conditions to health. This truism cannot be denied.

A little information will be given to you from behind the scenes, as it were, of medicine, as it will enable you to understand why a spirit of therapeutic *nihilism* occasionally manifests itself.

At the last session of the State Board of Medical Examiners a question was asked that inquired for the evidence of the possession of the knowledge of a fundamental principle, without which many diseases cannot possibly be *understood*, although their symptoms can be memorized.

Memorized and *repeated, but* NOT *understood!* please observe, and, consequently, not properly and intelligently treated even if only with pure air, sunlight, food and rest.

The question was: discuss symbiosis with special reference to pathogenesis. It is perhaps permissible for me to explain that some disease-producing organisms require oxygen for their activity, and the exercise of their morbid powers, and that if such organisms enter the body, they will be inert if oxygen is not available.

There are other organisms, also disease-producing, which thrive and exert their disease-producing powers in the absence of oxygen, and, as these so-called germs in nature are frequently associated, it is easy to understand that if the non-oxygen microbes grow, and in their vital activity evolve from the tissues oxygen, how the virulent oxygen-demanding germ will thereby be supplied with the necessary environment for its activity and result in disease.

Thus symbiosis renders comprehensible how, respectively, oxygen- and non-oxygen-requiring germs may or may not afflict the human economy with diseases like tetanus, typhoid fever, diphtheria, etc.

It cannot be denied by any one, except those who are inadequately educated, that medicines and drugs, those means supplied by an all-wise Creator, which also similarly affect the cells of the human body, will be, when intelligently administered, proven to be a vital necessity for the proper treatment, relief and cure of disease.

Pharmacy, therefore, instead of becoming obsolete and useless, I affirm, with all the emphasis at command, will be still more strongly demanded than ever before, and just as soon as pharmacy and medicine will only admit to their ranks those who are adequately educated, this one great and undeniable fact of existence will be an unquestioned reality. The time has come not to dispense with our respective professions, but with those who are not competent and fit to be identified with them.

A word as to pharmacy as a specialty of medicine. A superficial thought suggests such a possibility, but serious contemplation negatives the idea, because comprehension of the vast field embodied discovers what necessarily *must* be a separate, distinct and important science and art.

It can only be possessed by those who devote their entire life and talents toward securing a *pure materia medica*, and possessing the ability to properly prepare and compound the same for accurate administration. This *qualification* can in no sense constitute a specialty of medicine. It is essentially, naturally and inherently an indispensable auxiliary to medicine—a substantial means to an end, as needful to the success of the art of treating disease as is the rudder to the proper and certain navigation of the ship. One cannot exist without the other. Alone either is comparatively useless, and the ultimate and practical outcome of both renders each equally important and an indisputable necessity.

MR. M. I. WILBERT

said: In reference to the relations between physicians and pharmacists, there are but two points on which I should like to add something further.

The assertion made by me that the pharmacy of the future might be developed as a specialty of medicine, etc., no doubt constitutes a misuse of the word specialty, as we naturally think of it in connection with the practice of medicine at the present time. If, however, we consider pharmacy, as we should and must, as a part, or a department, of the science of medicine, we may with propriety refer to it as a specialty of that science, dealing particularly with the collection, preparation and preservation of the materials used in the study, prevention and cure of disease.

The manufacture and sale of nostrums is undoubtedly the most general, but nevertheless the most deplorable, practice of the present-day pharmacy in America. It is also the one feature which, more than any other, will serve to bring about a radical change in the practices, position and condition of the pharmacist of the near future. In this connection it may be said that many of us have failed to keep in touch with the medical discoveries and the resulting change in ideas and medical practices of later years, and therefore have failed to realize that ideas and practices which were con-

sidered permissible, if not absolutely correct, fifty years ago may be, and many of them rightly are, considered obsolete, if not positively dangerous, at the present time.

Broadly speaking, nostrums may be classed in one of two general groups. (1) Those popularly termed patent medicines, and properly consisting of all medicinal preparations advertised or sold directly to the lay public, and (2) those preparations, generally known as proprietary remedies, that are exploited to, or through, medical practitioners. Preparations belonging to either of these two divisions are secret preparations, so far as any definite knowledge, by others than the manufacturer, of their composition or contents is concerned. In addition to this, the claims that are made for the efficiency and usefulness of these various preparations are necessarily more or less misleading to a large number of people.

To appreciate this latter statement more fully, it must be remembered that there is what may be termed a psychological element necessarily connected with all matters medical. For instance, an individual suffering with some real or supposed complication of diseases will invariably take a different view of a verbose, but really meaningless, statement of supposed facts than one who is positive that he is neither ill nor likely to be ill in the near future.

The same is true of physicians. The man who has had a wide and varied experience, and who is well versed in the rudiments of drug therapy, will take an entirely different view of the problematical claims that are made in connection with a secret remedy than the one who has had little or no experience in this particular line. Moreover, the results obtained by a man of the latter type from the use of a nostrum, are usually misleading to him, and through him to others, from the fact that he has been able to observe only the fact whether or not his patient improved, or seemed to improve, under the influence of a certain drug or compound, forgetting entirely that there may be, and really are, dozens, if not hundreds, of additional factors that may and do contribute towards the ultimate result in any given case. After all, then, it is simply a question of point of view, or of seeing truth as we are able to recognize it. If our education or information is such that we can get above the facts in the case, and review them collectively as a whole, we can readily form a satisfactory and correct opinion, based on the ultimate result. If, however, we are not in a position to command this necessary broad survey of the sum

total of all the facts and factors in any given case, our ideas and opinions, and all our statements based on them, will necessarily be the product of our estimation of such facts and factors as are evidenced to us from our point of view.

This line of reasoning explains why so many really honest men in the drug business to-day continue in their (supposed) time-honored prerogative of dispensing mixtures for this, that or the other disease regardless of the fact that, by imparting a false feeling of security to a patient or his friends, they, not infrequently and unwittingly, are the direct cause of unnecessary life-long suffering, or assist the grim reaper, death, to fill an untimely and premature grave.

It must be remembered, also, that in the minds of many physicians counter prescribing is not confined to those isolated cases where a druggist, without license, looks at the tongue, feels the pulse and takes the temperature of a patient, with a view of doling him out a mixture especially designed for his particular case, but that, on the other hand, it includes also the making and sale of panaceas or nostrums designed for the cure of diseases that are still, though erroneously, considered to be well known and definite entities.

Of proprietary medicines, little need be said, in conclusion; they are best described as a futile attempt of the blind leading the blind along unknown and comparatively dangerous paths, and cannot be tolerated in the practices of professional or scientific men.

PHARMACY AND CHEMISTRY AT THE WORLD'S FAIR.

By Carl G. Hinrichs, Ph.C.,
Professor of Chemistry, Marion-Sims Dental College.

(*Concluded from Vol. 76, p. 573.*)

VII. PHARMACEUTICAL EDUCATION.

The Louisiana Purchase Exposition was of great educational value in some directions; in others, and especially along the lines of pharmaceutical teaching, it was lamentably lacking; for we found only two pharmacy schools represented in the Palace of Education; one from New York City, the second from far-away Sao Paulo, Brazil. The small exhibits of these two schools cannot be said to represent pharmaceutical education. We are glad to say that the profession of pharmacy was not entirely without representation, for nearly all

national exhibits in this building had some publications on the general educational work of the respective country—Germany excepted. It is but natural that those countries where the practice of pharmacy has no marked characters of the purely business feature (such as patent medicines, soda, cigars, laundry, and the like) the pharmacist is expected to comply with very rigid educational standards. In this connection I may state that the gentleman in charge of little Sweden's exhibit stated to me that a certain large pharmaceutical house of our country extensively advertised a certain nostrum of wonderful medicinal virtues; the government authorities promptly took up the matter, which ended Yankee enterprise in that chilly clime. Nor must the reader believe that lands where one pharmacy to every 20,000 inhabitants or more is necessarily a veritable bonanza for the pharmacist; for not all people are such voracious patent medicine consumers as the Americans and the English. The people are also more addicted to the use of the homely herb of their garden, consequently the taking of a little bitter wormwood tea takes the place of patents among the hardy Hungarians, Swedes and mountain dwellers of Europe generally. If we desire to learn from any country, it is from the land of the mother tongue and similar racial peculiarities—Great Britain.

The educational side of the Britisher is distinctly British, in that all tests depend upon examinations by certain authorized bodies or boards. Any one may be examined for a degree before their universities, if he feels able to do it, whether he studied in England or not. So is the Pharmaceutical Society authorized by Parliament to conduct examinations to determine the fitness of a druggist to practice his vocation. Great Britain is always derided in some quarters, on account of its excessive examinations. It is generally admitted by the more advanced men in pharmacy and science that a single examination, or a number of them, cannot determine the fitness of a student. Professor Remington emphasizes this in a recent paper published in this JOURNAL. The examination is very good for many mediocre memorizers, though not exceptionally brilliant in the class-room; a certain race is always good at the so-called final, as I have noticed.

Professor Searby, himself a graduate of old England's most noted school, that of the Pharmaceutical Society, has recently championed higher requirements for entry to the American College. We may,

therefore, be pardoned for taking up what will undoubtedly prove a very dry subject: how other people must study to become pharmacists. The Britishers have probably realized the fact that the future chemist begins in the drug-store; naturally, they worry not at all about how fit the student that enters the college may be; in fact, he need not attend any school, to become a licensed chemist; in this, then, they are like our State requirements. We Americans are always too fast; the Britisher is proverbially slow. How excessively slow is their way to the young man's goal! He must first become a student apprentice at the age when he will still suck "mints;" should he be permitted to attend to these delightful duties without a preliminary education? Certainly not. The young Britisher must know his Euclid and Latin thoroughly, in addition to a comprehensive knowledge of the mother tongue, before he may enter upon the above mentioned pleasant occupation. Why should our colleges worry about the educational abilities of their students, when the State does not? Why pester the legislators to recognize their diploma as a mark of peculiar fitness? the lawmakers always scent graft a mile off. Why cannot these self-same schools go before their state association and work up a little steam in the right direction, make the trade see the advisability of having apprentices, or, as we call the ever moving young men, "clerks," attain at least a good, sound, old-fashioned English education, before they enter the store? This would probably raise a howl among many druggists; they may urge that the boys will be too dainty, stuck up, look down upon many of the new registered druggists as ignoramuses, and similar unwarranted notions may be flung about; also that most popular reason, the boys will want more than they are worth. It is just these men who are now complaining that they cannot get help which is worth what they pay; this class of druggists will always complain, but will not think ahead. If such a demand were enforced by law, the result would tend to cause older boys to enter the drug-store; young men who would have a higher consideration of their employer than the thoughtless youngsters the druggist now delights to hire because they are cheap. If any one who has access to the published class pictures of the English schools, such as Muter's, Brixton, or of the Metropolitan, will compare them with class pictures of our Western schools, he will not fail to notice the more mature appearance of the English

students. Some American students are no more than kids—all the way from sixteen years down.

The young man who wishes to enter a British chemist's shop (corresponding to our drug store) as an apprentice, must pass before the recognized board in the following topics: English grammar and composition, Latin, a modern language, algebra, arithmetic and Euclid. This bill of fare would correspond to at least the fourth year in one of our American high-schools. The boys will be about seventeen to eighteen years old when they pass this examination; nor is the examination gratuitous, for it has a two-guinea fee attached, *i. e.*, $10.00.

After the young man has fulfilled his academic requirements, which fact is officially recorded by the examining board, he may enter the "chemist's" shop as a student or apprentice. This English method seems decidedly more logical than that of our States, which do insist on some educational requirements before they admit to the examination for assistant. There are cases on record where young men have graduated from reputable Colleges of Pharmacy and have failed to pass this preliminary examination. It seems rather cruel and decidedly unreasonable to require such young men, who have shown ability by their success in obtaining the degree Ph.G., to make up such elementary deficiencies. Medical Boards in many States demand that the medical student shall have the requisite common schooling before he may enter a medical college. Naturally, such boards believe in the *quid pro quo*, and no young doctor will ever be held up by the board later on, as is the case with the druggists mentioned.

After three *legal* years as apprentice, the British applicant may take the so-called minor, for which he pays a fee of $50. He must also have attained his majority. This English examination covers more ground than that of the first year in the American College. It also embraces such important features as a good knowledge of the Poison Act, and a prompt and accurate dispensing of a prescription. The examiner grades him on the time it takes, and his proficiency in the art, as evidenced by an actual filling of the prescription. So we see such a young man must be a capable professional aid to his employer.

Later the major examination, a most thorough and searching probing of the future "chemist's" knowledge, chemical, pharma-

ceutical, botanical, posological, etc. For this the examinee must pay a fee of $150, and the successful candidate will then be registered as a "chemist." The Pharmaceutical Society of Great Britain strictly enforces the law against all who attempt to circumvent or evade these requirements of the English Pharmacy Act.

It will have been noticed that the English law takes no cognizance of the College of Pharmacy, or in fact of any school. Continental nations, on the contrary, do demand of the applicants for license to practice an attendance at some pharmacy school; searching examinations are not, however, overlooked. France may be taken as the type case of the dignified profession of pharmacy of Germany, Sweden, Russia, Portugal and the other European countries.

The French law demands of the prospective pharmacien de premiere classe (the grade of pharmacien de seconde classe is no longer) that he shall first spend three years in a pharmacie. He must work practically in the laboratory, also shall the élève, at regular intervals of time, have his name inscribed on the records as being actually in harness. To be permitted the honor of making these "inscriptions," he must first of all be a bachelor of arts. His three years completed, as attested by his inscriptions, he must submit to an examination called the "validation de stage." This examination costs 25 fr. 25, that is, $5.05; this is reasonable, but how many of our young registered druggists would like to face this first mild examination?

"Validation de stage" comprises four topics: (1) the preparation of a chemical or galenical preparation, as found in the Codex (four hours are allowed for this ordeal); (2) he must prepare a magistral preparation; (3) recognize thirty plants or parts of plants pertaining to the materia medica; (4) he must answer divers pharmaceutical questions. Each of these last three topics requires no more than thirty minutes to answer. Having successfully passed this "validation de stage," the young man must enter one of the écoles de pharmacie; all have the same identical courses by legal decret, but the école superieur de Paris is the most noted.

Three years pass at the College of Pharmacy. Every three months must the student be inscribed on the record, showing that he is attending to his duties. At the end of each year the student submits to an examination, which is both oral and practical.

We can do no better than to copy the subjects in which he is examined.

First year deals with the physico-chemical studies and their application to the subject of pharmacy.

Practical examination in chemical analysis.

Oral examination in physics, chemistry and toxicology.

Second year dealing with the natural sciences and their application to pharmacy.

Practical examination in micrography.

An oral in botany, zoology, mineralogy and hydrology. If the student fails in his practical examination in either of the first two years, he fails, and must take the entire work of that year over again.

The third year studies are the truly pharmaceutical. The examination embraces two parts. The first part embraces a practical examination; the quantitative determination of the strength of a medicament; also the recognition of simple and complex medicaments or preparations; this corresponds to our so-called recognition of specimens.

The oral embraces the subjects: chemical and galenical, pharmacy and materia medica.

The second part of the final examination takes up four days. Eight chemical or galenical preparations must be made; the student is also subjected to a thorough oral examination on these preparations.

Having successfully passed all examinations and been in regular attendance during these past six years, the bachelor of arts becomes the pharmacien de premiere classe.

In conclusion, we may say that the British custom seems more applicable to American conditions at the present time. This would gradually raise the dignity of pharmacy as a profession. Then in the future the French or Continental system might gradually be introduced.

THE PROPER SCOPE OF SCIENTIFIC (SO-CALLED EXPERT) TESTIMONY IN TRIALS INVOLVING PHARMACOLOGIC QUESTIONS.[1]

By Solomon Solis Cohen, M.D., of Philadelphia,
Professor of Clinical Medicine in Jefferson Medical College.

(*Continued from p. 13.*)

(6) That one must be expected to answer frankly all questions by opposing counsel, without reservation or evasion, regardless of the effect of such answers upon the theory of either side.

(7) That one is not to be asked irrelevant questions, for the purpose of consuming time or raising clouds of dust; or to be asked to make captious criticisms of the testimony or methods of others; or in any way to be made a party to methods of presentation of facts and opinions, which, however admirable from the viewpoint of an attorney's efforts to serve his client, are opposed to the spirit of truth-seeking science.

It is not to be expected that one can alter the badgering, hectoring, and efforts at confusion which present juridical standards permit and even applaud in cross-examination. But one can at least refuse to supply ammunition for such practices, to support them, or to countenance them.

A more difficult ethical question than we have yet considered is that presented to a chemist who has been called upon to make an analysis of suspected substances, when his analysis reveals the presence of that which the attorney consulting him wishes absent, or *vice versa*. Is he to insist upon being called as a witness? It is no longer a question of testifying—for the attorney will not wish him to do so—but of not testifying. An analogous question is sometimes presented to pathologists. How shall it be decided? Suppose a chemist or a pathologist has been asked to examine the tissues of a person suspected to have been poisoned, for evidence of the poison or its effects? He fails to find such evidence. This is not a mere matter of opinion, but of fact. Or, take a somewhat simpler case: suppose a chemist is asked to examine suspected powders or liquids or foodstuffs for the presence of poison and fails to find it? It is possible that his negative testimony might help

[1] An address delivered before the Philadelphia College of Pharmacy, November 15, 1904.

the accused person. If the public prosecutor nevertheless proceeds to trial, being satisfied upon other grounds that such is his duty, and fails to call the chemist or pathologist who has made the negative finding, is it the latter's duty to volunteer his evidence? The answer to that question is beyond the scope of this paper, but, nevertheless, the question needs to be stated.

SUMMARY OF CONCLUSIONS.

(1) The difficulties attending expert evidence upon pharmacologic questions could be in large part obviated (*a*) by adopting the principle of *controlled examinations* with *preservation of portions of materials examined* and *exhibition of material results*; (*b*) by submitting scientific questions to the judgment of a jury or commission of experts who should hear the relevant testimony in the presence of both parties and their counsel, and report to the court, and whose unanimous report or discrepant reports should be submitted to the trial jury as part of the evidence in the case. Before such a commission scientific experts might be allowed to appear frankly as advocates arguing upon evidence submitted, but no mere opinions should be given as evidence; it being the function of the commission to formulate opinions for the guidance of the court having final decision of the case.

(2) As the plan suggested in the foregoing paragraph is not likely to be adopted for many years, if ever, the duty devolves upon physicians and pharmacists called as expert witnesses under the present system to guard their own actions and evidence so that the reproach of partisanship and venal interest which now, justly or unjustly, attaches to the testimony of experts upon pharmacologic questions may be removed from the honest and competent majority and a sharp line of distinction be manifest between them and others.

(3) The chief difficulties that honest, sincere and competent expert witnesses have to meet are of four orders:

(*a*) *The necessity to state technical matters in untechnical terms.* There is no way of avoiding this and the expert can only meet it as best he may, deliberately using technical terms when necessary to make the record complete, and afterward explaining them as well as possible in untechnical language.

(*b*) *The combination of witness and advocate in the same person.*

This tends to the presentation of partial and therefore partisan testimony, which, in the attempt to draw conclusions from insufficient evidence, may lead to undue magnification or minimization of certain facts, to the slurring or suppression of material data, to the introduction of irrelevant matters and especially to captious criticism of the investigations or opinions of others. This can be remedied only by the expert himself.

(*c*) *The confusion of judgments of fact, the result of scientific research and analysis, with opinions; and like confusion concerning statements of facts of general scientific knowledge.* This can be remedied only by calling the attention of courts and lawyers to the principles involved and thus educating them to a better method.

(*d*) *The request for formulation of an opinion addressed to one whose studies have not qualified him to speak authoritatively upon the special question involved.* The remedy for this lies exclusively with the expert himself.

(4) It is not fair to condemn lawyers for the abuse and misuse of expert evidence, seeing that lawyers can use an expert witness for no purpose which the witness refuses to be used for. Courts may, however—from the viewpoint of scientific investigation—err both in the admission and in the exclusion of expert testimony.

(5) Newspapers and the public in general usually do grave injustice to the members of our professions, inasmuch as they do not know how often physicians, chemists, and pharmacists, after examination of the facts in special cases, refuse to testify on behalf of the interests that have consulted them.

(6) Physicians and pharmacists asked to give expert testimony should stipulate that they are to tell the whole truth and to answer frankly and fully the questions of counsel on the other side; that they are not to be asked to lend themselves to pettifogging or obscuration of any kind; that their opinions are to be held subject to modification by any additional facts that may be disclosed; and that they are not to become advocates on or off the witness stand.

(7) The expert or scientific advocate has an honorable and useful field of work as assistant and adviser to counsel; but his place in court is by the side of counsel, not on the witness stand.

1525 Walnut Street.

A RECORD OF TWO TOXICOLOGICAL INVESTIGATIONS.[1]

By Geo. M. Beringer.

The intent of this paper is to record for scientific reference the toxicologic investigations made in two celebrated trials in Burlington County, N. J., in both of which women were defendants, and indicted for murder in the first degree. These have heretofore been reported only in the newspapers, which reports are not permanently available records or sufficiently accurate for scientific reference.

The case of the State of New Jersey *vs.* May L. F. Haines. On March 31, 1901, Gwendoline Haines, a frail child, aged two years and nine months, stepdaughter of the defendant, died without having had sufficient medical attendance, and under circumstances that were considered suspicious. The only other occupants of the house at the time were Mrs. Haines and her infant son, about one year old.

About eight o'clock in the evening of that day the mother called at the office of a physician nearby, explaining that Gwendoline was suffering from a slight cold, and he prescribed a few homeopathic pellets of aconite. About one hour afterward she again called and requested his immediate attendance on the child, who, she said, had a convulsion. The physician responded promptly, as he lived but a few hundred yards away; but on arrival at the house found the child dead. He discovered no evidence of convulsions, but numerous bruises on the body, and as the neighbors told him of harsh treatment and punishment having been administered by the stepmother, notably a severe beating the day prior, he declined to issue a death certificate and referred the case to the coroner.

The undertaker, however, was promptly summoned, arriving at midnight; he immediately embalmed the body, injecting into the abdominal cavity near the navel about 1 pint of fluid. The following day the coroner issued a burial permit, and within a few days the body was interred in Harleigh Cemetery, at Camden, N. J.

Relatives on the child's maternal side, noticing the scars and bruises on the child's corpse, demanded an official investigation, and on Saturday, April 6, 1901, the body was disinterred, and a post-mortem examination made by Dr. R. H. Parsons and Dr. A. H. Small, the authorities anticipating the finding only of evidence of severe

[1] Read at the Pharmaceutical Meeting held at the Philadelphia College of Pharmacy, November 15, 1904.

beating. These doctors reported that they found the nose broken, eyes black and blue, the upper lip deeply cut, and the left ear partly torn from the scalp, and numerous other bruises on the body and head. The direct cause of death they then considered as due to meningitis, the meninges being greatly congested and angry red immediately underneath a decided contusion of the scalp.

There was very little to suggest even the possibility of criminal poisoning, merely some abrasions and scars on the chin and lower lip attracted the attention of a relative as possibly indicating burns from carbolic acid. Desiring to satisfy the imaginations of the relatives, portions of the viscera were removed, and after placing these in jars, were handed to Mr. J. E. Doughty, a grand-uncle of the child, to deliver to a chemist. With no definite idea as to what to do, or as to what was expected of him, he carried them to Philadelphia to consult with his brother, and he returned again that evening to his home at Haddonfield, N. J., and retained the package containg these jars in his possession until Monday morning, April 8th, when finally, acting under positive instructions from the prosecutor, he delivered them to the writer, at 11 A.M.

The viscera were contained in two 1-quart Mason's fruit jars, wrapped in newspaper and enclosed in a paste-board box, and then placed in a wicker-ware hamper, which was securely tied with twine, and showed no evidence of having been tampered with. On opening the hamper and package I found the two jars, the one had a piece of paper tied to it, on which was inscribed, "This jar contains stomach, liver and kidneys." It contained, however, the stomach, part of liver, one kidney and the heart, and all in a well-preserved condition, and in addition, a small amount of liquid exudation. The other jar contained the brain, and was so marked by a piece of paper attached by a string.

The lack of proper precautions exhibited in the placing of a number of organs in the same jar, leaving the jars unsealed, and for nearly two full days in the custody of an unofficial citizen, to be delivered to the chemist, even after having been carried out of the jurisdiction of the State, were certainly inconsiderate acts, and, in the light of subsequent developments, it was feared at one time might have proved a serious detriment to the case. Consequently, the prosecutor, after receiving my report, decided to have a second autopsy, which was made by the same physicians on April 20th,

when the following materials were removed: the remaining kidney, 8 inches of the intestines, a section of the liver, a section of the lung, the spleen, and portions of the muscular tissue from the calves of both legs. These were placed in separate, new, clean jars and sealed, and delivered in person to Prof. Frank X. Moerk for analysis.

The Stomach and Contents.—The stomach was first taken for examination. It was in good condition and tied at both ends with a white string in surgeon's knots. It was cut open and the contents poured into a clean dish. The mucous surface was carefully examined, and was almost of a uniform pale pinkish color, and showed no evidence of undue inflammation or reddening. In a few places some mucus-like substance still persisted, and an examination by the unaided eye, and also with a pocket lens, failed to disclose any particles of grit or crystals. There were only a few fine particles, resembling charcoal, adhering to the wall at different points. The contents consisted of 50 c.c. of partly digested food, resembling and having the odor of sour milk. The surface was washed with the distilled water, and the washing added to the contents, and the entire bulk made up to 100 c.c.

One-quarter of this amount (25 c.c.) was taken and rendered distinctly acid, and distilled for volatile poisons, such as hydrocyanic acid or carbolic acid, which had been suggested; the results, however, were negative. Another 25 c.c. was tested for alkaloids or other organic poisons, but I failed to get any results, and a small portion was then acidified and tested with hydrogen sulphide. It yielded a decided yellow precipitate. This precipitate was found to be insoluble in hydrochloric acid, but soluble in ammonia, ammonium carbonate and potassium bisulphite, indicating that it was arsenious sulphide. This conclusion was readily confirmed on the application of Reinsch's test with a portion of the sulphide. Crystals of arsenic trioxide were readily obtained by sublimation from the copper, and on dissolving these from the tube with a small quantity of boiling water, the solution readily responded with characteristic arsenic precipitates with ammonia-cupric sulphate and silver nitrate. A small portion of the sulphide mixed with a dry sodic carbonate, and potassium cyanide was readily reduced, giving a garlic-like odor, and forming a metallic ring on the tube. With sodium oxalate as a reducing agent, similar results were obtained, and these

metallic rings or mirrors were readily oxidized to arsenic trioxide. The remaining one-half of the stomach contents was taken for the quantitative determination of the arsenic. This was mixed with 5 c.c. hydrochloric acid and 50 c.c. distilled water and warmed and strained, and the residue again washed with water acidified with hydrochloric acid, the strained liquids mixed, filtered and precipitated with hydrogen sulphide. The sulphide was purified by solution in ammonium hydroxide, and reprecipitated with hydrochloric acid in the presence of a few drops of hydrogen sulphide solution, the solution and reprecipitation being repeated until it was free from organic matter. The purified sulphide was then dried and washed with carbon disulphide, then with petroleum ether, dried, finally dissolved off the filter with ammonium hydroxide and evaporated on a tared watch crystal. The yield of arsenic sulphide was ·1 gram, equivalent to 2·48 grains of arsenious acid, for the entire stomach contents.

In order to apply Marsh's test, a portion of the sulphide was oxidized in a porcelain crucible with nitric acid, and then fused with sodium carbonate and sodium nitrate. The fused mass dissolved in water, acidified with sulphuric acid, and evaporated until fumes were given off, and then cooled, and diluted with water. This solution containing arsenic as sodium arseniate, was used in the Marsh's test, and a few drops were sufficient to give beautiful tube and plate mirrors of arsenic.

Stomach Wall.—The membrane of the stomach, or stomach wall, was cut up into small pieces and digested in a water bath, by the method proposed by Fresenius and Babo, using 100 c.c. water and 40 c.c. pure hydrochloric acid and potassium chlorate gradually added, until a clear solution resulted. This was filtered and warmed until the odor of chlorine was dissipated, and the arsenic then precipitated as sulphide, and the sulphide purified from sulphur and organic impurities in the same manner as that obtained from the stomach contents. The results calculated as arsenic trioxide, gave 3·348 grains obtained from the stomach wall.

The Liver.—Simultaneously with the examination of the stomach contents, a portion of the liver was tested for organic poisons, with negative results. One-half of the part of the liver was utilized for the determination of arsenic, and the method of Fresenius and Babo was found satisfactory. The sulphide, however, contained a

quantity of coloring matter associated with other organic matter, so that the method of purifying by solution in ammonia was found to be inapplicable. It was necessary to oxidize it with fuming nitric acid, convert it into a sodium salt, and reprecipitate the sulphide, which was dried, washed with carbon disulphide, petroleum ether, and finally dissolved in ammonium hydroxide and evaporated on a tared watch crystal. The results indicated 3·93 grains arsenic trioxide present in the section of liver I examined.

The Kidney.—The kidney was treated in the same way as the liver, and yielded 1·589 grains arsenic trioxide.

The Heart.—This was also treated in the same way as the liver, and yielded 0·49 grains arsenic trioxide.

The Liquid in the Jar—The exudation from these organs remaining in the jar was also extracted, and yielded 0·617 grains.

The Brain.—The brain matter weighed 750 grammes, and was in a pulpy and badly decomposed condition when received. It was subjected to the method of Fresenius and Babo, and the filtered clear solution, on treating with hydrogen sulphide, yielded a decided precipitate, which separated very slowly, and which consisted almost entirely of organic matter. The quantity of arsenic present was so small as to yield only the very faintest reaction with Reinsch's and with Marsh's tests, and this trace was not ponderable.

My determinations were based upon the older method of separating the arsenic as sulphide, and yielded a total of 12·454 grains of arsenic trioxide from the materials I examined.

RESULTS OBTAINED BY PROFESSOR MOERK.

Prof. Frank X. Moerk adopted a similar method for the separation of the arsenic from the materials he analyzed. He reported that he purified the sulphide by oxidation with nitric acid, then dissolved in ammonia, and converted it into magnesium-ammonium arsenate, from which the quantity of arsenic trioxide was calculated.

The results were as follows:

The kidney weighed 557·86 grains, and yielded 1·471 grains As_2O_3.

The piece of intestine weighed 422·83 grains, and yielded 1·147 grains As_2O_3.

The spleen weighed 339·5 grains, and yielded ·656 grains As_2O_3.

The section of the lung weighed 653·85 grains, and yielded ·433 grains As_2O_3.

The section of the liver weighed 969·43 grains, and yielded 1·354 grains As_2O_3.

The muscles of the legs gave a very faint trace, not sufficient to weigh. From his examinations he isolated 5·061 grains of arsenic trioxide, a total of 17·5 grains having been recovered from the organs examined by both. Typical specimens and tests were prepared from each organ, and exhibited in the trial along with the recovered arsenic.

The Embalming Fluid.—Suspecting that the embalming fluid was an arsenical solution, a sample was immediately procured from the undertaker, who stated positively that it was from the very same case and lot as used in embalming this body. Analysis showed it to contain as the valuable ingredients, formaldehyde and potassium nitrate, but to be entirely free from arsenic. Another sample was purchased in Philadelphia, and analyzed, with the same results.

The indictment against Mrs. May L. F. Haines was moved at Mount Holly on March 25, 1902, before Judge Charles G. Garrison, Prosecutor Samuel A. Atkinson, Esq., and J. C. Hendrickson, Esq., for the State, and Eckard P. Budd, Esq., for the defense. The trial lasted for more than a week, and every point was strongly contested. The State contended that death was due to meningitis, produced by either the wounds from cruel beating, or from arsenical poisoning, or from a combination of both. The defense claimed that the arsenic found was introduced after death by the embalming process. Their contention was strengthened by recalling the undertaker, who, although he had testified both at the coroner's inquest and as a witness for the prosecution, at the trial, that he had used only this arsenic-free embalming fluid for a long time prior to this case; nevertheless, as a witness for the defense, he appeared to be in doubt, and stated that he occasionally used two other embalming fluids, both of which were stated to contain arsenic, and had used them at times with the same syringe as used in this case.

The jury acquitted the defendant.

THE CASE OF THE STATE OF NEW JERSEY VS. ANNIE R. PHARES.

The defendant in this case was charged with having killed her husband, Albert A. Phares, of Springfield Township, Burlington

County, by the administration of strychnine, on March 9, 1903. The evidence showed that her husband was strong, hearty and generally healthy, and of a cheerful disposition, who, to the day of his death, was planning and working for his re-election as constable. At this time, he had some slight ailment, diarrhœa and vomiting. On the morning of this particular day the wife drove to Columbus, a near-by town, and visited the office of Dr. J. E. Dubell, who prescribed for her husband some diarrhœa tablets, containing calomel, morphine sulphate, capsicum, ipecac and camphor, and also a liquid containing fluid extract of gentian and syrup. At the doctor's office she inquired if it would be necessary for her to obtain a prescription in order to purchase strychnine. She then proceeded to a druggist in the same town and purchased 30 grains of strychnine, which was properly labeled, and the sale entered in his poison record, along with the name of the witness to the sale, and the use for which the strychnine was said to be needed, namely, "to kill rats." She inquired here as to the amount of strychnine it would take to kill a man, and was cautioned to be very careful, as the amount was sufficient to kill many persons.

Shortly after reaching home she administered to her husband, in the presence of a friend, who had called, one-third of a teaspoonful of brown powder. Mr. Phares complained of the intense bitterness of the medicine. They all sat down in the kitchen to dinner, but the husband ate only a few spoonfuls of a proprietary food known as "Corn Crisp," and then, complaining of not feeling well, retired to a lounge in the sitting-room adjoining, the rest of the company remaining in the kitchen until the meal was completed. After a short time the defendant administered a second dose of the same powder, and about the same amount as in the first dose. The husband again complained of the exceedingly bitter taste, and very soon after this he became restless and uneasy. His muscles began to twitch and jerk, he clenched his hands, straightened out his legs, threw the head back, and had convulsions in rapid succession. In one of these paroxysms he fell off the lounge. He retained consciousness, the mind remained clear, and he continually complained of the bitter taste of the medicine, and called for water and milk. The convulsions grew worse, and he died at 7.15 P.M., before the arrival of the physician.

Immediately after the death of her husband, the defendant made

conflicting statements regarding the disposition of the strychnine she had purchased, stating that she had burned it in the presence of three witnesses, who testified that they did not see her burn any in their presence, and knew nothing at all of the purchase of the poison until it became public, through the investigation of the authorities.

The autopsy was conducted the next day by Dr. Richard H. Parsons and Dr. J. E. Dubell The body then exhibited marked rigidity, the arms and wrists were bent, and the hands clinched, the legs extended, the feet arched and turned inward, and the head thrown back. The membrane covering the brain and upper part of the cord was somewhat engorged with blood. The heart was full of dark blood, and the brain, heart, lungs and kidneys were all in a healthy condition. The post-mortem examination failed to reveal the cause of death.

The various organs removed from the body were each placed by Dr. Parsons in perfectly clean, new fruit jars, labelled, tied and sealed, and delivered to the writer in person on Tuesday, March 10th.

The Stomach and Contents.—The stomach and contents weighed 410 grammes. The external appearance of this stomach showed numerous congested blood-vessels, giving it a distinct bright red coloration throughout.[1]

The stomach was cut open and the contents poured into a clean dish. This consisted of a fluid mass of yellowish green color, which weighed 145 grammes, and mixed with this partly digested food were some fat globules, but no particles of meat. A microscopic examination showed that the solid part of the contents consisted largely of starch, many of the grains still retaining sufficient of the characteristic shape and markings by which corn and pea starch were identified. The internal surface of the stomach showed the mucous membrane of a yellowish color, marked here and there by materials of a yellowish-green color, and close inspection showed only a few small blood clots $\frac{1}{16}$ to $\frac{1}{8}$ inch in diameter, but no marked signs of inflammation or corrosion.

[1] The writer is not a pathologist, and does not know if the appearance of the external surface of this stomach had any significance whatever, but he was impressed with the fact, because a short time before he had made the examination of the organs of a dog poisoned by strychnine, and the stomach of the animal showed very similar coloration and arterial congestion.

Preliminary tests for volatile poisons and for non-organic poisons gave negative results, but a few drops of the filtered liquid contents gave distinct creamy precipitate, with Meyer's reagent, and a decided brown precipitate with iodo-potassic iodide. The following method which had on previous occasions given good results was adopted. The stomach wall was cut up into small pieces with a clean scissors, and then beaten to a pulp, and this and the stomach contents warmed on a water bath for one hour, with 100 c.c. of distilled water and sufficient sulphuric acid added to render it distinctly acid. This was now strained through a double piece of clean washed gauze and the dregs warmed up again with 100 c.c. of acidulated water, and again strained with pressure. The strained liquid acid solutions were combined, filtrated and evaporated on the water bath to a syrupy consistence. This was extracted with alcohol by repeated application and decantation. The alcoholic solution filtered and evaporated, and the residue extracted by treating with portions of distilled water, acidulated with sulphuric acid, as long as the washing gave a precipitate with Meyer's reagent. This acid aqueous liquid concentrated on the water bath to about 40 c.c. was filtered into a separatory funnel, and then treated successively with petroleum ether, chloroform and amyl alcohol. These solvents removed a large amount of the extraneous coloring matter and organic substances from the acid solution. To remove traces of the amyl alcohol, it was again washed with petroleum ether, then separated and warmed for a few minutes to dispel any traces of the latter solvent, then cooled and returned to the funnel and rendered alkaline by ammonium hydroxide and extracted with several successive portions of chloroform. The chloroform solution on evaporation gave a residue, having a very bitter taste, giving alkaloidal reactions, and imperfectly the well-known strychnine color reaction with potassium dichromate and sulphuric acid.

This residue, not being colorless or free from foreign organic substances, needed further purification, which was satisfactorily accomplished by the following process: The chloroform residue of impure alkaloid was dissolved in a few cubic centimeters of distilled water and just sufficient sulphuric acid to render the solution faintly acid. This was now filtered through a minute filter into a small separatory funnel, and washed with small portions of chloroform as long as the chloroform extracted coloring. The solution was now

rendered alkaline with ammonium hydroxide and then sufficient acetic acid added to render just acid and again extracted with portions of chloroform as long as coloring was removed. It was then again rendered alkaline with ammonium hydroxide and extracted with chloroform as alkaloid. This process of purification was repeated until the resulting alkaloidal residue was pure white and crystalline. A considerable portion of the alkaloid was undoubtedly lost in this process of purification, but the resulting alkaloid in each case was finally pure, and gave clearly and sharply the characteristic color reaction with sulphuric acid, and oxidizing agents.

The pure strychnine thus isolated from the stomach and contents weighed 5 milligrammes, equivalent to $\frac{1}{13}$ of a grain.

A minute quantity of the recovered alkaloid was dissolved in water acidulated with a trace of acetic acid, and injected under the skin of a frog. His breathing became quick and hasty, and in a few seconds he attempted to jump, and his hind legs, after one or two jumps, became quite stiff, and in four minutes after the injection he attempted to jump but fell over on his back, and could not get up again, and he continued in this attitude, having tetanic convulsions, with straightening of the limbs, arching of back, etc. At the least touch there would be produced the characteristic strychnine tetanic spasms, and death finally resulted.

The portion of the liver weighed 320 grammes and was subjected to the same method of examination as the stomach. The coloring matters here present clung very tenaciously to the alkaloidal residue and a pure white product was obtained only after several purifications. The isolated pure white strychnine weighed 1·7 milligrammes, equivalent to $\frac{1}{39}$ grain.

The two kidneys weighed 394 grammes, and the entire amount was used in the examination. The recovered purified alkaloid weighed 2·2 milligrammes, equivalent to $\frac{1}{30}$ grain of strychnine.

The total amount of strychnine recovered from these organs amounted to 8·9 milligrammes, equivalent to $\frac{1}{7}$ of a grain or a little more than $\frac{1}{8}$ grain of strychnine sulphate. The total weight of the organs examined was approximately 2½ pounds. The recovered alkaloid in each of the three determinations was pure, colorless and gave the characteristic color reactions and the physiological test for strychnine.

The indictment against Mrs. Phares was moved at Mount Holly

on June 29, 1903, before Judge Charles G. Garrison. Samuel Atkinson, Esq., Prosecutor of the County, for the State, and Eckard P. Budd, Esq., for the defense.

The State alleged as motives for the crime the collection of a life insurance policy of $1,000, carried by the husband, and the desire of the defendant to marry a young farmhand, with whom she had maintained improper relations for a long time. The latter was admitted by the defense, and also that death was undoubtedly the result of strychnine poisoning, but the defendant testified in her own behalf, that the strychnine had been placed on a desk in the sitting-room, and that her husband must have taken same while alone in the room during the time that the rest of the party were at dinner. The powdered condition of the medicine she explained by the fact that the envelope in which the doctor had dispensed the tablets had fallen on the carriage floor, and had accidentally been trodden on by her heel on the way home.

The jury considered this plea as establishing a reasonable doubt, and sufficient to justify them in rendering a verdict of acquittal.

EDITORIAL.

EXPERT TESTIMONY.

With this issue is completed the paper on expert testimony by Dr. Cohen, which was begun in our January issue. Dr. Cohen has given no little thought to this subject, having more than a year ago read a paper on "The Judicial Determination of the Cause of Death" before the Philadelphia Medical Jurisprudence Society.

Dr. Cohen's presentation of the subject leaves no doubt as to the proper course to be pursued when either the analyst or physician is called upon to testify in cases involving pharmacological questions, or indeed as to what should be the attitude of scientific experts in general. In addition Dr. Cohen suggests a method in the employment of experts, which, if followed, would raise expert testimony from a plane where it is too often the subject of ridicule at the hands of both lawyers and courts, to a plane where it would have the stamp of truth and authority. Not only this, such a method would largely do away with the waste of time and the great expense involved in trials where expert testimony is employed.

That the method suggested by Dr. Cohen is opportune and even likely to be carried out in a measure at an early day is shown by the fact that an attempt is now being made by the Massachusetts legislature "to pass a bill to regulate the employment of expert witnesses, to reduce the cost of expert testimony and to introduce official expert evidence by giving the courts authority in homicide cases to appoint one or more suitable and disinterested persons to investigate the issues and testify at the trial. This provision, however, does not prevent either the prosecution or the defense from producing other expert witnesses. The proposed measure provides that no expert witness shall be paid compensation for his services in excess of the ordinary witness fees provided by law, unless the court awards him a larger sum.

"The bill provides that no more than three experts shall be allowed to testify on either side, except in prosecutions for murder. The proposed legislation is not to apply to witnesses testifying to the 'established facts or deductions of science, nor to any other specific facts, but only to witnesses testifying to matters of opinion.' The bill seems to be aimed particularly at the hand-writing expert, whose testimony is necessarily an expression of opinion."

The question is a far-reaching one, not only concerning the public welfare and the legal profession, but also the status of the scientific expert and even of science itself; for if supposedly scientific men can be found who render opinions diametrically opposed when there should be but one opinion or judgment on the same set of facts, what shall we say of the testimony of such men and of the sciences which they represent, or even of truth itself? It is high time that an effort be made to rescue the calling of the scientific expert from the grip of the sordid influences which surround it and to place it where it belongs, not only that the calling may not fall wholly into disrepute, but that the best interests of those it is intended to benefit may not suffer.

We are fortunate in having this subject presented at this time in the clear and convincing manner it is in Dr. Cohen's paper.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

PHARMACAL JURISPRUDENCE. By Harley R. Wiley, A.B., LL.B. Hicks-Judd Company, San Francisco.

The author in his preface states that he was impelled to this collation of legal principles and cases relating to the legal status of pharmacy through an actual need for a treatise or collection of authorities as an aid to his work as a lecturer on the subject in the University of California.

The same need has been felt by all pharmacists actively engaged in attending to the interests of the profession in legislative matters as well as by lawyers having cases in which a clear understanding of the accepted relations of the profession of pharmacy to statute, case and constitutional law was necessary.

The opening chapter is a short but clear historical resumé of the evolution of the fundamental legal principles involved that is so lacking in the usual technical phraseology of legal text-books that the average pharmacist can read it with understanding, and, it might be added, will be benefited by doing so.

The author clearly affirms and vigorously sustains by logical argument the constitutionality of properly framed laws regulating the practice of pharmacy, and in addition cites judicial opinions from authorities of the highest standing in support of this view of the question.

There is a clear exposition of the border line between the practice of pharmacy and medicine that is drawn by the statutes relating to the two professions.

The chapter on contracts explains clearly the difference between the common law doctrine of "Caveat emptor," in which the purchaser relies upon his own judgment, and "Caveat venditor," in which the seller is warned to beware on the ground that he is the responsible party to the transaction on account of his special knowledge—thus explaining the principle that a pharmacist should and does guarantee to all who seek his services that he has the requisite scientific skill and knowledge.

The law of liability of the pharmacist in his relations with his patrons is clearly set forth in a special chapter, and in view of the increasing activity of Pure Food Commissions and State Boards of Pharmacy, it is a matter that will be profitably studied by any pharmacist.

The work is bound with an alphabetical table of cases that will prove useful to all lawyers having pharmaceutical clients.

Taken in its entirety as an example of industry in an untilled field, there is small reason for the modest plea of the author in the preface, "that those who examine its contents will do so with such indulgence as may seem due to the work as a pioneer in its peculiar field." W. L. CLIFFE.

TEXT-BOOK OF ORGANIC CHEMISTRY. By Henry Leffmann, A.M., M.D., and Charles H. LaWall, Ph.G. Philadelphia: P. Blakiston's Son & Co. 1904. Pp. 231.

This little book is stated in the preface to be offered as an aid to the study of organic chemistry in connection with general and professional courses.

The subject of organic chemistry, whether considered from the purely scientific side or from the points of view of its technical application and its bearing on medicine and pharmacy, has grown to such dimensions that it is a matter of difficulty to know what to select for discussion. Whether a book of such limited size shall endeavor merely to serve as an introduction to the understanding of the field, or whether it shall endeavor to give descriptions and details as to any considerable number of compounds, is the question for decision. Remsen's well-known little book on Organic Chemistry is specifically an introduction to the subject, and mentions a limited number of compounds, with little descriptive matter; this book devotes 48 pages to the principles of organic chemistry and 166 pages to descriptive chemistry.

The section on the principles is in general well stated, but, being put compactly together, before any illustrative account of special compounds appears, is liable to lead to an attempt at memorizing work so well known and deplored by the teacher of chemistry. Pages 47 and 48 are specially noted as likely to encourage this kind of study.

The descriptive section, beginning on page 49, is, however, very clearly and interestingly written and conveys much information of value to the medical or pharmaceutical student. The numbered experiments following each section are well chosen and very helpful to the student who will carry them through. Attention is called, for example, to the experiments on pages 110 and 111 following

the section on the carbohydrates as showing how helpful such practical tests can be made.

Some inaccuracies should be noted, which will, of course, be corrected in a future edition. On page 73, the formula of calcium carbonate, in the last line, wants the final figure 3; on page 99 the formula of dextrose should be $C_6H_{12}O_6$; on page 101 the graphic formula for the ketonic glycerose is incorrectly given; on page 130, in the third line from the bottom, "oxidation" should read "nitration;" on page 198 the formula of hypoxanthin has 1 oxygen atom too much.

We would also criticise the authors' choice of terms in several places. On pages 59 and 60 they speak of ethyl aldehyde, propyl aldehyde, butyl aldehyde and amyl aldehyde. The almost universal usage of organic chemists is to name the aldehyde by the name of the oxidized radical, making these acetaldehyde, propionaldehyde, butyraldehyde and valeraldehyde. On page 126 the authors use the rather unusual spelling "kreasote." The German word is "kreosot," and the English word used by Allen, the British Pharmacopœia and others is "creosote." And on page 146 the use of the term "methyl anilines" as a synonym for "toluidines" is an error which has inadvertently crept in. In methyl aniline the methyl has been introduced in the side chain, and not in the nucleus, as in toluidine.

The sections on the proteids and on ptomaines and leucomaines are both very interesting presentations of these important subjects.

The book is neatly gotten up and attractive in appearance.

S. P. SADTLER.

PHILADELPHIA COLLEGE OF PHARMACY.

The quarterly meeting of the Philadelphia College of Pharmacy was held December 27, 1904, at 4 o'clock P.M., in the Library. The inclement weather and the Christmas holidy prevented the usual attendance, but ten members being present.

The President, Howard B. French, presided. The minutes of the semi-annual meeting, held September 26, and of the special meeting (called to take action on the death of First Vice-President William J. Jenks) were read and approved.

The minutes of the Board of Trustees for September, October and November were read by the Registrar, and approved.

The resignations of Lyman F. Kebler and E. H. Cone, previously offered, were accepted.

A letter was read from Miss Lydia D. Jenks, daughter of the late William J. Jenks, on behalf of herself and brothers, expressing their deep sense of appreciation of the sentiments embodied in the engrossed resolutions recently received by them from the College.

ABSTRACT FROM THE MINUTES OF THE BOARD OF TRUSTEES—SEPTEMBER.

The Committee on Property reported having had the rewiring for the electric lighting done in accordance with the inspector's plans.

Also that additional cases had been built in the pharmaceutical laboratory, and that all the woodwork had been repainted and put in first-class condition.

The Committee on Library reported quite a number of accessions, both by gift and by purchase.

Jesse Conner Chisholm, P.D., Joshua Evans Eckman and Charles Dunning French, having complied with all the requirements, were granted certificates of Proficiency in Chemistry.

The Committee on Commencement reported having secured the Academy of Music for the evening of May 18, 1905, for the Commencement.

The statement was made that the late William Weightman had purchased the property at 112 North Eighteenth Street, and that satisfactory arrangements had been made to lease it to the Board of Governors of the College House Association.

A letter was read from A. B. Hammond, Secretary of the Board of Education of Philadelphia, thanking the Board of Trustees for the Scholarship offered to the pupils of the public schools.

OCTOBER.

Section 7, Article VIII, of the By-Laws was amended to read: "The fee for examination and conferring of any degree and diploma of the College shall be $15, payable but once. The fee for examination and conferring of the Certificate of Proficiency in Chemistry shall be $15, and the fee for granting a certificate for any special course not otherwise provided for shall be $5."

The Committee on Property reported everthing in good condition.

Mr. W. A. Rumsey reported for the Board of Governors of the College House that all the necessary alterations had been completed.

Fifty students were now in the House, and it was expected it would soon be full.

The Committee on Membership was announced, viz.: Henry Kraemer, W. A. Rumsey, H. L. Stiles, James T. Shinn and C. A. Weidemann.

Mr. W. L. Cliffe, on behalf of the State Board of Pharmacy, expressed their appreciation of courtesies extended by the Board of Trustees.

Mr. Irwin I. Peiffer was elected to active membership.

Professor Remington announced that through the liberality of Mrs. John R. Drexel, a granddaughter of Henry Troth, one of the founders of the College, there would be established another scholarship, to be called the Troth Scholarship.

NOVEMBER.

The Committee on Library reported a number of additions by purchase, and by donations from Henry N. Rittenhouse and C. D. Ritchie.

The President announced that Prof. Samuel P. Sadtler had now completed twenty-five years' service in the College.

The Committee on Scholarships reported having awarded nine scholarships, two being to pupils from the public schools.

Aubrey H. Weightman, Pierce A. Dietrich and Charles W. Parsons were elected to active membership.

C. A. WEIDEMANN, M.D.,
Secretary.

PHARMACEUTICAL MEETING.

The Pharmaceutical Meeting in February will be held on Tuesday afternoon, the 14th, at 3 o'clock, in the Museum of the College.

Dr. H. W. Wiley, Chief of the Bureau of Chemistry of the United States Department of Agriculture, will give an address on "The Danger in the Use of Methyl Alcohol for Domestic Purposes."

Mahlon N. Kline, Chairman of the Committee on Legislation of the National Wholesale Druggists' Association, will read a paper on "Some Reasons why the Internal Revenue Tax on Alcohol should be Reduced, and why our Government should provide Free Denaturized Alcohol for Use in the Arts."

Prof. Samuel P. Sadtler will read a paper on "The Detection of Methyl Alcohol in Ethyl Alcohol."